

AP* Biology Daily Lesson Plans Curriculum

Table of Contents with Descriptions of Units

I. Fostering Student-driven Learning in an AP* class

This section describes the role of an AP teacher through the course of a one-year college level class. It gives concrete examples of how the teacher can make the class student-driven so that the students embrace the motivation and responsibility for their learning.

II. Year Calendar and Adapting to Class Schedules

The full year calendar provides a reference for the topic of each week and a brief description of the activities covered on any given day. There are lesson plans for a total of 142 class days (four days each week use a 50-minute period and 1 day each week uses a 90-minute period). All days are broken into timed activities that can be rearranged as needed. Timing and length of each topic are given so that chapter topics can conform to fit any school schedule or calendar to complete the necessary topics required for students to succeed on the AP Biology Exam in the time allotted.

III. Materials List

A list of all the supplies needed for this curriculum are listed by unit.

IV. Daily Lesson Plans

A. Review of Prerequisite Courses – 11 class days

Assuming that the students who are taking AP Biology have a varied background of preparation, the activities in this section teach the main concepts of chemistry and physics necessary to support the biology that is to follow. Fast-paced, kinesthetic classes set the learning expectations for the year. Study skills embedded in each lesson plan guide students through their first Free Response essays, train students in effective note-taking and offer help in test preparation. The scientific process is demonstrated daily in a form of student-centered teaching that nurtures curiosity through questioning and hypothesizing.

B. Daily Lesson Plans – Cell Biology – 28 class days

Students hone their microscope skills and refine their laboratory techniques by performing one AP lab or supplementary lab each week. Activities used to prepare students for laboratory exercises help students glean the main concepts from each exercise and extend the conclusions to permutations on the same themes. The lesson plans in this section show the teacher how to challenge students to demonstrate their understanding of complex concepts such as membrane transport, cellular respiration and photosynthesis by making three-dimensional models or by acting out cellular processes as a group in the classroom.

C. Daily Lesson Plans – Genetics – 29 class days

This section continues to emphasize the skills and techniques of classical and modern laboratory methods in biology using AP labs and supplementary exercises. Genetics concepts that tend to challenge many students are broken down into comprehensible bits with the use of analogies, puzzles and games. Students add depth to their Free Response essay writing, design a game to teach the process of transcription and translation and begin to explore careers in science.

D. Daily Lesson Plans – Evolution – 17 class days

In this section students begin to look at larger data sets with more variables, and move from glassware to computer analysis lab skills. Students glean information from skulls, skeletons and ecology to generate evolutionary hypotheses, then compare those to hypotheses generated using on-line molecular data bases. With a scavenger hunt and an independent research project, students become familiar with the diverse group currently called protists. They then move on to consider progressions in complexity by comparing the phyla of the animal kingdom. Dissection is used to reinforce students' understanding of evolutionary changes in anatomy through the major phyla, similarities in function and contrasts in form.

E. Daily Lesson Plans – Anatomy and Physiology – 29 class days

Students gain increasing autonomy in this section using the scientific process to design, critique, carry out and analyze experiments in physiology. Their lab expands to include themselves and their peers as they observe the patterns and changes that effect systems. Dissection of specific organs such as the eye or the kidney helps students to break down organ systems to their principle units of function. Guest speakers and field trips allow students an introduction to careers in medical science and a chance to question scientists who specialize in particular systems.

F. Daily Lesson Plans – Botany – 20 class days

In an ever broadening scope of laboratory skills, the final two units on botany and ecology utilize nature as living laboratory. Assignments such as a botany journal and a plant terminology picture book, allow students to create a customized exploration of vascular and non-vascular plants. Students learn to locate and collect plant specimens from their yard, the grocery store and flower shops with the goal of contrasting plant tissue types, pollination and seed dissemination methods.

G. Daily Lesson Plans – Ecology – 9 class days

By this point in the year students are highly successful at reading and utilizing their out-of-class resources such as their textbooks, videos and the internet and they look to the teacher to guide, support and challenge their growing knowledge base. The shift that has slowly progressed through the year to help the students become self-guided learners should be complete. Lesson plans in this section are full of games, simulations and field research techniques designed to explore the dynamic nature of ecology and to help students notice details or underlying principles they might not have acknowledged previously. Much of what students know about ecology was learned before they acquired a firm foundation in science, so class activities often reveal misconceptions. Consequently, students rebuild knowledge in an experiential manner.

H. Review for AP* Biology Exam

This section deviates from the daily lesson plan format to provide more flexibility for the teacher and to honor the needs of the students in the final weeks of test preparation. Lists of suggested in-class and out-of-class activities are offered to help students review.